TOMATO PRODUCTS

The present invention relates to novel tomato products having an improved saucing power in particular on pasta.

Tomato products, prepared from the tomato juice obtained by fruit trituration, seed and peel separation, are known in the prior art. The tomato juice is an aqueous suspension of insoluble solids in an aqueous solution wherein organic and inorganic substances are dissolved.

From the obtained juice other products such as tomato passatas and tomato concentrates can be obtained. Tomato passatas in general are obtained from juices by partial concentration. The tomato concentrates are obtained by stronger concentration processes. The methods generally used are the reverse osmosis, cryoconcentration and concentration by evaporation. By using the reverse osmosis it is not possible to operate at room temperature. Temperatures of about 70°C are requested in order to have a satisfactory concentration yield; furthermore it is necessary to clean and regenerate the membranes by means of chemical detergents, which must then be removed. In fact said compounds are pollutant of the tomato products. See C.S. Leoni "I derivati industriali del pomodoro", experimental Station for the food preserves industry in Parma, October 1993, pages 92-93. The cryoconcentration is inapplicable to the tomato juice due to the high percentage of solids in suspension, which would be separated together with ice. See page 93 of the previous quotation.

In practice the concentration by evaporation remains the method of choice to concentrate the tomato juice. See page 93 of the previous reference. Concentration by evaporation implies juice heating; the duration of heating and the maximum temperature reached in the juice during the concentration step lead to organoleptic and nutritional variations of the product. The organoleptic variations are a caramel taste and a typical cooking ("cotto") aroma present in tomato concentrates and they are mainly due to the formation during juice concentration of hydrogen sulphide, dimethylsulphide,

furfural, 3-methylmercaptopropanal, 2,4-heptadienal, acetaldehyde, phenylacetaldehyde. See S. Porretta "Il controllo della qualità dei derivati del pomodoro", experimental Station for the food preserves industry in Parma (1991), page 51; S.J. Kazeniac et al., J. Food Sci. 35 519 (1970).

The nutritional variations are mainly due to the degradation of the carotenoids present in the tomato and in particular of lycopene. The tomato as such and its products have a high nutritional value, deriving from the vitaminic components, and mainly from the contained carotenoids. It has been demonstrated that the tomato product consumption is associated to a risk decrease of some cancer types (prostata, pancreas, stomach). See H. Gerster, J. Am. Coll. Nutr. 1997, 16, 109-126; S.K. Clinton Nutr. Rev. 1998 56 35-51. The previously described beneficial nutritional effects are to be ascribed to the carotenoids contained in the tomato and in particular to lycopene. Recently it has been shown that during the concentration by evaporation of the tomato juice there is a degradation of carotenoids, lycopene too. See R. Gary et al., J. Agric. Food Chem. 2001 49 3713-3717.

It is also known that it is not feasible to filter the tomato products, in particular tomato juices and tomato passatas, since the filter is quite immediately occluded.

Most of the commercial tomato products must be diluted before use. The commercial tomato concentrates, for example in Italy, are classified as follows:

- semiconcentrate dry residue 12% by weight;
- concentrate (C) " " 18% " ;
- double concentrate (DC) " " 28% " ;
- triple concentrate (TC) " " 36% " .

Generally the concentrated products are diluted before and during the use. The saucing power of the triple concentrate (TC) as such, before dilution, is higher than that of the other commercial tomato products, concentrates included. By saucing power it is meant the product capability to stick to foods to which it is added, for instance pasta.

However, as above mentioned, said concentrated products must be diluted before or during use because of their too strong and unpleasant taste. Consequently the advantage of the higher saucing power of said products is lost. Generally all the commercial tomato concentrates having a dry residue above 12% wt. show such taste problem and therefore must be diluted.

If a semiconcentrate at 12% dry residue is used, since it generally should not be diluted before use showing no problems of unpleasant taste, the saucing power is very low, even lower than the saucing power of TC as such. The tomato products known as tomato passatas are used as a ready base for quick sauce preparation. Generally in tomato passatas the dry residue, which can be determined as described afterwards, is lower than or equal to 10% by weight, generally comprised between 8%-10% by weight.

The Applicant has surprisingly and unexpectedly found tomato products which do not need either dilution or concentration before their use, for instance on foods, said tomato products can also be used as such as foods, and have an improved saucing power, improved organoleptic properties, i.e. devoid of any caramel taste, bitter taste, cooking ("cotto") aroma, scur taste.

An object of the invention is a composition or a tomato product obtained from tomato juice or tomato passatas having the following composition in percentage by weight:

- dry residue 5,5 - 20%,
- water 94,5 - 80%,

100% being the sum of the two components,

wherein the amount of water insoluble solids and water soluble solids in the dry residue range in percentage by weight as it follows:

- water insoluble solids from 18% to 70%,
- water soluble solids from 82% to 30%.

Preferably the ranges of water insoluble solids and water soluble solids in the dry residue in percentage by weight are as it follows:

- water insoluble solids: 20%-50%,

- water soluble solids 80%-50%.

Still more preferably the ranges of water insoluble solids and water soluble solids in the dry residue range in percentage by weight are the following:

- water insoluble solids: 30% to 50%,
- water soluble solids 70%-50%.

The total dry residue, the water soluble solids and the water insoluble solids are determined as described in the Examples.

The tomato products of the invention are obtainable by the process described below that, differently from the products of the prior art, includes a more thorough separation of the tomato serum from the water insoluble solids, that affords to obtain tomato products according to the invention, having a water insoluble solid content in the dry residue even up to 70%.

To the invention tomato products it is possible to add lyophilized or cryoconcentrated serum, or serum concentrated by osmosis membrane or by evaporation under vacuum, to further improve or varying the taste. It is thus possible to obtain, for example, tomato products having a lower content of water insoluble solids in the dry residue.

Therefore in the invention tomato products it is possible to adjust the ratio between the water insoluble solids and those water soluble. The Applicant has found that by varying the amount of water soluble solids in the total solids of the composition the taste properties of the product (more or less intense tomato taste), can be suitably dosed. The olfactory properties of the product (fresh tomato smell), since the water insoluble solids retain the volatile components, mainly depend from the amount of water insoluble solids in the total solids.

Furthermore the Applicant has found that the invention tomato products can unexpectedly incorporate, for example, by mechanical mixing, without showing any serum separation, animal and vegetable fats solid at room temperature, such for example butter or margarine, and/or fats liquid at room

temperature as for example vegetable oils, for example olive oil, and/or cheese having soft- or fresh-grain or hard-grain and grated.

The starting tomato product used to prepare said mixed products should preferably have a water insoluble solid content and water soluble solid content in the dry residue in the following ranges as percentages by weight:

- water insoluble solids from 30% to 70%,
- water soluble solids from 70% to 30%;

still more preferably:

- water insoluble solids from 35% to 70%,
- water soluble solids from 65% to 30%.

The amount of fats and/or oil which can be incorporated in the composition ranges from 10 to 25% by weight referred to the weight of the starting tomato product; soft-grain cheese can be instead incorporated in any desired amount, since the two components (soft-grain cheese and tomato product) are perfectly miscible in all weight ratios; the amounts of soft-grain cheese which can be incorporated are for example from 50% to 300% by weight referred to the weight of the starting tomato product.

When food fats that are solid at room temperature are used, it is preferable to heat preliminary said fats, before mixing with the tomato product of the invention, at least up to their softening point but preferably not above their melting point.

The amount of hard-grain and grated cheeses which can be incorporated ranges from 10 to 25%. Said compositions can be used as ready-to-use sauce for foods since they incorporate, as said above, oil, butter and/or cheeses. To said compositions other usual ingredients of food products, such for example essence aromas, preservatives, etc, can be added.

As said, the invention tomato products and the compositions obtained therefrom as above defined have an improved saucing power and improved organoleptic and nutritional properties in comparison with the products on the market.

The invention products, in particular those obtainable by

mixing the invention tomato products with fats and/or oils and/or cheeses, can also be used as such as foods. For example said products can be spread on bread, as it is made for soft cheese.

Said saucing power is combined with improved organoleptic properties, i.e. without a caramel, or a bitter, or a sour taste. Said organoleptic properties are instead completely absent in the commercial products showing a good saucing power. See the comparative Examples on the commercial products TC, DC and C.

The Applicant has found that the amount of water insoluble solids which must be present in the tomato product to confer an improved saucing power must be at least 18% weight with respect to the dry residue of the tomato product, preferably from 20% to 50% weight.

As foods on which to use the tomato products of the invention, pasta, meat, fish, vegetables, etc., can be mentioned.

A test to determine the saucing power is described in the Examples.

The invention products show a high content of water insoluble solids. The Applicant has found that the amount of water insoluble solids in the commercial products is not higher than 15% in the dry residue. For example in the fresh pulp the amount of water insoluble solids is generally about 12.5% of the total tomato solids (dry residue). See in "Tomato paste, Purée, Juice & Powder" P. G. Goose, Food Trade Press Ltd 1964, page 69.

The tomato compositions of the invention, as said, have an improved saucing power. As it is known, the final step for preparing in home kitchens a sauce starting from fresh tomato or from a tomato product, comprises heating with fats or oils and other aromas until obtaining a sauce endowed with satisfactory saucing power. The tomato compositions of the invention show a further advantage, with respect to the known tomato sauces, that they do not need a prior heating step before use. In this way the detrimental effect of the

temperature during the preparation of the tomato-based sauces is avoided. In fact in said heating step licopene is solubilized by fats, and in this way this compound is easily degraded by the concomitant effect of light and oxygen in the hot conditions of cooking.

The process for obtaining the tomato compositions of the invention is described herein below. It has been found, unexpectedly and surprisingly, that by using filtration but maintaining under a slow stirring the tomato suspension to be filtered, it is possible to filter the starting tomato suspensions, since the tomato mass in such conditions detaches from the filter the sediments that constitute the impermeable layer depositing on the filter surface, and incorporates them. In fact, as said, it is known that it is not feasible the filtering of the tomato products, in particular tomato juices and tomato passatas, since the filter is quickly occluded by an highly impermeable layer. The filtration process according to the present invention proceeds instead rapidly. It is ended when substantially there is no more serum separation. A compact mass is formed by filtration that can be easily recovered, since it does not stick to the filter.

It is therefore a further object of the present invention a process for the separation of the liquid (tomato juice serum) from a tomato suspension by using a separation solid-liquid apparatus wherein the mass or suspension to be filtered is maintained under slow stirring, at an angular speed generally from 1 rpm to 20 rpm, preferably from 2 rpm to 10 rpm, preferably the stirrer being of a shape to convey the suspension toward the central axis of the apparatus, or there is not a stirrer and it is the apparatus that rotates. In the alternative, the apparatus used for separating the liquid from a tomato suspension is a sieve maintained under a motion such as for example under an oscillating motion, or preferably under a nutational motion, the oscillations per minute being generally from 1 to 20 oscillations/min, preferably from 2 to 10 oscillations/min.

The process of the invention is preferably carried out

under sterile conditions; in the alternative the final tomato product can undergo a sterilization process.

In said case sterilization can be performed with conventional methods, preferably by operating under mild temperature conditions, preferably under high pressures, for example comprised between 5,000-7,000 Atm.

The invention process is carried out by operating at temperatures generally in the range 5°C-25°C, preferably 10°C-15°C, at atmospheric pressure, or using pressures slightly higher than that atmospheric, from 760 mm Hg (0.101 MPa) up to 900 mm Hg (0.120 MPa) or by applying pressures slightly lower than the atmospheric pressure, down to 450 mm Hg (0.06 MPa). As said above, if the process of the present invention is not operated under sterile conditions, the recovered tomato product at the end of the process is subjected to sterilization processes.

The process for obtaining the invention tomato products can be performed in a separation solid liquid apparatus constituted for instance of a vessel made for instance of food grade stainless steel, having walls with openings or slots formed for instance with woven wire cloth, or with screens such as for instance wire screens or welding screens, or instead said walls have holes such as for instance fine punched holes or drilled holes or slot milled holes or beam perforated holes (laser perforation or electron beam perforation), being the width of the openings of slots, or the diameter in the case of holes, not greater than 0.1 mm and preferably not lower than 0.02 mm. The slots length is not critical. For example said length can range from 30 cm to 2 meters, depending on the volume of the tomato juice to be treated. When the separation solid liquid apparatus has a bottom wall, this is preferably made of a plate without slots or holes.

Preferably the separator has a cylindrical section.

The separator is furthermore equipped with a device for mechanical stirring. Stirring must be very slow, the angular speed is generally from 1 rpm to 20 rpm, preferably from 2 rpm

to 10 rpm, the device being of a shape such that the solid is conveyed in the separator central zone (with reference to the longitudinal axis). It has been found that said stirring prevents the solid from adhering and accumulating on the separator walls, so that no impermeable layer formation occurs in the separator during the processing.

The distance between the separator walls and the stirrer blades is from 0.5 to 2 cm.

According to the present invention process the separator is charged with the tomato juice, obtained for example by tomato fruit trituration and seed and peel separation, or charged with tomato passatas, obtained for example as the tomato juice but operating at lower temperature during the centrifugation step. The tomato juices have been previously treated according to known processes, for example by "hot break", "cold break" processes, or by applying high pressures, for example of the order of 5,000-7,000 Atm (5.06×10^2 MPa - 7.09×10^2 MPa), to inactivate enzymes.

The tomato mass to be filtered can optionally be protected during the process by operating in an atmosphere of an inert gas, e.g. nitrogen. In this way it is avoided the contact of the tomato mass with oxygen in the presence of the light. This optional step is requested in case the temperature, for unforeseen events, during the process results higher than 25°C. By operating in this way no lycopene losses occur.

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The process ends when in the separator there is a compact mass which does not separate any longer tomato juice serum.

By operating with the separation process according to the present invention carotenoids, lycopene comprised, remain in the mass which separated from the liquid part or tomato serum.

Unexpectedly and surprisingly with the invention process there is no clogging of the separator walls having openings or holes of the above said sizes since unexpectedly and surprisingly a compact mass is formed, as said above. Said result is unforeseen since one would expect the formation of a product layer adhering to the walls substantially

impermeable.

Said mass, formed during the invention process, is compact and does not adhere to the walls whereby it is easily recovered from the separator. The invention process has a very high productivity since there are no clogging on the walls with consequent process downtime for the separator cleaning.

The tomato juice serum percolated from the separator walls, containing a large part of the soluble solids of tomato juice, is generally recovered by lyophilization or cold concentration with known methods, for example cryoconcentration.

Another method to obtain the invention tomato products is to use a concave- or flat-shaped sieve, having holes diameter or slots width not greater than 0.1 mm, preferably not lower than 0.02 mm, wherein it is transferred the starting tomato juice, obtained as above. The juice into the sieve is kept under an oscillatory motion until a compact mass, as above said, is formed, which does not separate any longer the serum.

The compact mass is easily recovered since it does not adhere to the sieve.

The temperature conditions are those indicated above for the process using a separator; preferably atmospheric pressure is used.

The number of oscillations/minutes are those herein above reported.

A further process used to obtain the invention tomato products consists in charging the tomato juice, treated as above, on a cylinder constituted by food grade stainless steel wherein the walls have openings or slots formed for instance with woven wire cloth, or with screens such as for instance wire screens or welding screens, or instead said walls have holes such as for instance fine punched holes or drilled holes or slot milled holes or beam perforated holes (laser perforation or electron beam perforation), being the width of the openings of slots, or the diameter in the case of holes, not greater than 0.1 mm and preferably not lower than 0.02 mm.

Said cylinder has inside a stirrer in the form of an

archimedean screw revolving free in the fixed cylinder, or consists simply of a rotating tube wound helically about a cylindrical axis. Rotation of the moving part must be very slow, generally at an angular speed of 2-10 rpm. The process is preferably carried out under the temperature and pressure operating conditions above described for the process in which a separator is used.

Preferably the cylinder is in an horizontal position, and has a diameter which can for example range from 30 cm and 1 meter, length from 2 meters to 20 meters. Preferably from 2 meters to 5 meters for apparatus working in a discontinuos way. Preferably about 20 meters for apparatuses working in a continuous way.

For discontinuous apparatuses the juice is let pass in the cylinder, with several recycling steps, until a compact mass is formed and there is no separation of tomato serum any longer.

When treating tomato suspensions obtained from partially ripened tomatoes, the slots width and the holes diameter of the separation liquid solid apparatus can reach also values not higher than 0.5 mm, preferably about 0.3 mm.

The apparatus for obtaining the tomato products of the present invention, comprising the filtering nets, can be of plastic material or of metal, steel included. Preferably the apparatus is made of food grade inox steel. When a plastic material is used, it can be cited propylene homopolymers or copolymers, ethylene homopolymers or copolymers, etc.

The serum is recovered as above indicated.

As said, the separated serum contains a great part of the water soluble solids contained in the tomato juice. The Applicant has found that the organoleptic properties (taste) of the invention tomato products can be modified by adding water soluble solids from lyophilized or concentrated serum. Generally serum is cold concentrated by cryoconcentration, or can be treated with the other described methods.

With the above processes tomato products are obtained according to the invention having a content of water insoluble

solids in the dry residue even up to 70%.

Generally, with the invention process are obtained tomato products having a content of water insoluble solids and of water soluble solids in the dry residue in the following ranges:

- water insoluble solids : 30% - 70%,
- water soluble solids : 70% - 30%.

To said tomato products it is possible to add lyophilized, or cryoconcentrated serum, or concentrated as described, to further improve the taste. It is thus possible to obtain, for example, tomato products having a lower content of water insoluble solids in the dry residue, generally comprised between 18 and 30%.

The tomato products according to the present invention allow to maintain the organoleptic and nutritional properties of the fresh tomato. Therefore in the present invention products there are no variations of the organoleptic properties, such for example it happens in the tomato products of the prior art wherein it is noticeable, for instance, a caramel taste and/or a cooking ("cotto") smell.

Also the nutritional properties remain unaltered, since there is no alteration of the carotenoids, in particular of the lycopene, as it occurs in the commercial products.

The tomato compositions of the present invention can have a tomato taste that could result, depending on the water soluble/insoluble solids of the composition, more or less strong than the tomato sauces available on the market. The point to be stressed is that the taste of the commercial tomato sauces depends on the variety of tomatoes used and on their ripeness. Unexpectedly with the process invention it is possible to have tomato sauces having a constant taste from one production batch to another. This is a remarkable result from a commercial point of view. The Applicant has found that this taste variation depends on the ratio between soluble and insoluble compounds present in the tomato compositions. The present invention makes also possible to produce tomato products which more favourably meet the personal consumer's

taste, since the ratio water soluble/insoluble solids, as said, can be therein varied.

The following ~~not limiting~~ Examples illustrate the invention.

EXAMPLES

Characterization methods

Determination of the saucing power of a tomato product according to the invention

- Materials:
  - tomato product to be tested,
  - vegetable oil, preferably olive oil,
  - full length, not broken spaghetti No. 12 De Cecco trade mark with cooking time indicated by the manufacturer 12 minutes,
  - sea salt.

90 g of tomato product to be tested and 10 g of vegetable oil (condiment total weight: 100 g) are introduced into a vessel, preferably a plastic vessel, previously weighed and having 1 liter capacity.

70 g of spaghetti are cooked apart, in 1 liter of water containing 5 g of sea salt, for the time indicated on the package. At the end the cooked spaghetti are strained until no drops form any longer.

The cooked spaghetti are added to the condiment previously prepared in the plastic vessel and by a fork they are carefully mixed slowly for 5 minutes. The vessel is then put on a boiling water bain-marie for 5 minutes, without mixing spaghetti. From the vessel with a fork the spaghetti are taken in a number of 2-3 at a time and without shaking them, it is let fall in the vessel the condiment which tends to immediately detach.

In the plastic vessel it remains the condiment which has not adhered to the spaghetti. Lastly the plastic vessel is weighed and in this way it is determined the condiment weight which has not adhered to the pasta. The difference to 100 (initial condiment weight) gives the amount which has remained attached to the pasta (Q_1).

The saucing power is defined on the basis of the following equation:

$$\text{Saucing power} = \frac{Q_a \times 10}{100}$$

Determination of the dry residue: total solids

The total dry residue is determined in the tomato juice using a vacuum stove as described in Journal Officiel des Communitées Européenes 7.6.86 L.153 pages 5-6.

Determination of water soluble solids

The determination of water soluble solids has been carried out using a refractometer (Brix degrees), with the method based on Journal Officiel des Communitées Européenes 7.6.86 L.153 pages 6-9.

Determination of water insoluble solids

The determination of water insoluble solids has been carried out by calculating the weight difference between the dry residue and that of the water soluble solids (Brix value), as reported in "Tomato Production, Processing and Technology 3rd Ed." by W.A. Gould, CTI Publications, Inc., 1992 page 317.

Determination of the rheometric properties

In a Dynamic stress Rheometer SR-200 (Rheometric Scientific) the shear stress (Pa) with respect to the speed gradient (s^{-1}) has been measured.

EXAMPLE 1

Preparation of a tomato product (Ro2 code)

The processing is carried out under sterile conditions.

10 Kg of tomato juice (free from seeds and peels), previously hot break to inactivate enzymes, are portionwise transferred in a 10 litre separator equipped with stirrer. The separator is constituted by food grade stainless steel wherein the walls are constituted by woven wire cloth having a hole diameter of 0.5 mm, the bottom wall of the separator does not have slots or holes. The stirring in the separator is such that the solid is conveyed towards the central zone of the separator. The distance between the separator walls and the stirrer blades is of 0.5 cm. The stirring (3 rpm) is started

and it is operated at a temperature in the range 5°C-10°C.

After 3 hours stirring speed is reduced to 2 rpm. It is noticed that the mass in the separator has become compact and homogeneous. After 7 hours from the process beginning, no serum is any longer separated from the mass in the separator. Stirring is interrupted and the obtained product is discharged. 2.7 kg of tomato product Ro2 are recovered.

The product analysis is the following:

- dry residue: 10% by weight;
- water: 90%;
- water soluble solids: 50% by weight with respect to the dry residue.
- water insoluble solids: 50% by weight with respect to the dry residue.

The rheological properties of the product Ro2 have been measured in comparison with the following commercial products: triple concentrate (TC), double concentate (DC), concentrate (C), tomato passatas.

The shear stress/speed gradient (s^{-1}) trend is reported in the following figures and the respective data in the Tables as indicated hereinunder:

- Ro2, TC: Fig. 1 and Tables 1 (Ro2) and 3 (TC);
- TC, DC: Fig. 2 and Tables 4 (DC) and 3 (TC);
- TC, C: Fig. 3 and Tables 5 (C) and 3 (TC);
- Tomato passatas: Fig. 4 and Table 6.

The Figures show that Ro2 has rheological properties that overlap to those of TC and are superior to those, respectively, of DC, C and tomato passatas.

EXAMPLE 2

Preparation of a tomato product (Ro1) by adding to the product Ro2 lyophilized tomato serum

980 g of the product Ro2, to which 20 g of lyophilized tomato serum are then added, are transferred into a vessel equipped with stirrer, in a sterile environment. It is stirred at 8 rpm at a temperature in the range 5°C-10°C, until a homogeneous mass is obtained (product Ro1).

It is found that Ro1 has a dry residue of 11.8% by

weight, water 88.2%, the water soluble solids are 58.5% and the water insoluble solids are 41.5% of the dry residue.

The rheological properties (shear stress/speed gradient (s^{-1}) trend) of the product Ro1 have been measured and compared with the same commercial products used for obtaining Ro2.

The Ro1 trend is reported in Fig. 1 and the data with which the rheogram has been plotted are reported in Table 2.

It can be repeated the same conclusions above mentioned for Ro2.

EXAMPLE 3

Preparation of compositions of the invention tomato products with vegetable oil

A composition of tomato product Ro1 and olive oil was prepared. In a vessel, under stirring at 200 rpm, olive oil was slowly added, at small portions, to the product Ro1, leaving the mass under stirring for 5 minutes. The englobed oil amount is 15% by weight. The product was recovered and let stand one month at +4°C, in a closed vessel, without showing substantial oil separation.

EXAMPLE 4

Preparation of compositions of the invention tomato products with vegetable oil

The Example 3 was repeated but adding all at once, slowly, to Ro1 an oil amount equal to 15% by weight with respect to the Ro1 weight. After leaving the mass under stirring for further 5 minutes from the end of the addition, the product was recovered. The same results of the Example 3 are obtained.

EXAMPLE 5

Preparation of composition of the invention tomato product Ro2 with food fat solid at romm temperature

The Example 3 was repeated but using a solid fat (butter), previously heated at 40°C and then mixed with the tomato product Ro2 for 5 minutes (200 rpm) after the butter addition. The total added butter corresponds to 20% by weight of Ro1. After cooling a solid mass was obtained, from which serum does not separate, even after 20 days of storage in refrigerator at

5°C.

EXAMPLE 6

Preparation of a composition of the invention tomato products Ro1 with food fat solid at room temperature

Example 5 was repeated but adding a total amount of butter of 300% by weight with respect to the tomato product Ro1, leaving then under stirring (200 rpm) for 15 minutes after the addition to homogenize the mass. After cooling a solid mass was obtained, from which serum does not separate, even after 40 days of storage in a refrigerator at 5°C.

EXAMPLE 7

Preparation of a composition of Ro1 with soft-grain cheese

In a vessel, under stirring (200 rpm), to the product Ro1 different amounts of Philadelphia® Light cheese have been added. It has been found that this soft cheese is miscible in all the ratios with the product Ro1. In particular compositions having the following weight ratios Ro1/cheese: 50/50, 75/25, 25/75 have been prepared.

EXAMPLE 8

Preparation of a composition of Ro2 with hard-grain, grated cheese and a food fat solid at room temperature

In a vessel, under stirring (200 rpm), to 30 g of tomato product Ro2, 30 g of butter heated to 40°C and 30 g of grated Parmesan cheese have been added. After 15 minutes of stirring the mass becomes homogeneous. At this point it is cooled to room temperature. A solid mass is obtained from which serum does not separate, even after 20 days of storage in a refrigerator at the temperature of 5°C.

EXAMPLE 9

Preparation of a composition of Ro1 with soft-grain cheese

In a vessel, under stirring (200 rpm), to the product Ro1 different amounts of Jocca® cheese have been added. It has been found that this soft cheese is miscible in all ratios, as that used in the Example 7, with the product Ro1. Compositions having the same weight ratios Ro1/cheese as those of the Example 7: 50/50, 75/25, 25/75, have been prepared.

EXAMPLE 10

Evaluation of the saucing power of the invention tomato products in comparison with commercial products

The method indicated in the characterization methods for the determination of the saucing power has been used, for the invention products Ro1 and Ro2 and the comparative commercial products triple tomato concentrate (TC), double concentrate (DC), concentrate (C) and tomato passatas.

The results are reported in Table 7. The data show that Ro2 shows the best combination of saucing power and of organoleptic properties (taste). In any case the invention products show an improved saucing power combined with improved organoleptic properties with respect to the commercial tomato products.

TABLE 1

RO 2 test: 1

Stress Pa	Ela Pa-s	Rate s-1	Torque N-m	Time s	Temp °C	Strain(t) %	SS Time s	SS Slope	Theta rad	G' Pa	G" Pa	Position	stress(t) Pa
20.0000	1.46E+05	2.05E-04	5.03E-04	0	21.0	2.20E-01	30.0001	0.33466	0.22E-05	13184.1	0.00E+00	7	20.0000
33.6594	1.39E+06	2.42E-05	5.84E-04	29	21.0	4.14E-02	30.0001	0.03283	1.60E-05	01360.2	0.00E+00	7	33.6594
37.7664	DIV0	0	6.33E-04	59	21.0	0.00E+00	30.0001	0	0		0.00E+00	7	37.7664
42.3746	1.24E+06	3.41E-05	7.10E-04	89	21.0	6.21E-02	30.0001	0.04133	2.51E-05	60284.3	0.00E+00	7	42.3746
47.5461	1.43E+06	3.33E-05	7.97E-04	120	21.0	6.17E-02	30.0001	0.04017	2.09E-05	91939.5	0.00E+00	7	47.5461
53.3465	1.20E+06	4.10E-05	8.94E-04	150	21.0	6.21E-02	30.0001	0.0527	2.51E-05	05964.9	0.00E+00	7	53.3465
59.8557	1.20E+06	4.89E-05	0.001	180	21.0	6.21E-02	30.0001	0.05360	2.61E-05	96454.2	0.00E+00	7	59.8557
67.1592	1.02E+06	6.55E-05	0.00113	210	21.0	7.24E-02	30.0001	0.08091	2.93E-05	92762.9	0.00E+00	7	67.1592
75.3539	1.08E+06	3.80E-05	0.00126	240	21.0	1.14E-01	30.0001	0.0806	4.61E-05	66233.8	0.00E+00	7	75.3539
84.5405	1.08E+06	4.49E-05	0.00142	271	21.0	1.03E-01	30.0001	0.07438	4.19E-05	81747.1	0.00E+00	7	84.5405
94.865	2.26E+06	4.20E-05	0.00159	301	21.0	1.45E-01	30.0001	0.00772	5.86E-05	65515.5	0.00E+00	7	94.865
106.44	2.25E+06	4.73E-05	0.00178	331	21.0	1.97E-01	30.0001	0.01428	7.96E-05	54165	0.00E+00	7	106.44
119.420	2.40E+06	4.98E-05	0.002	360	21.0	2.38E-01	30.0001	0.01102	9.63E-05	50204.7	0.00E+00	7	119.420
134	2.23E+06	6.02E-05	0.00225	390	21.0	3.00E-01	30.0001	0.00914	1.21E-04	44676	0.00E+00	7	134
150.351	1.01E+06	8.33E-05	0.00252	421	21.0	4.03E-01	30.0001	0.01243	1.63E-04	37274.1	0.00E+00	7	150.351
168.696	1.55E+06	1.09E-04	0.00283	451	21.0	5.79E-01	30.0001	0.01107	2.35E-04	29126.2	0.00E+00	7	168.696
189.20	1.04E+06	1.83E-04	0.00317	481	21.0	9.31E-01	30.0001	0.04403	3.77E-04	20334.3	0.00E+00	7	189.20
212.376	6.37E+05	3.34E-04	0.00356	511	21.0	1.83E+00	30.0001	0.021	7.41E-04	11601.1	0.00E+00	7	212.376
238.29	1.97E+05	0.00121	0.00399	541	21.0	5.32E+00	30.0001	0.06057	0.00215	4482.39	0.00E+00	7	238.29
267.366	4825.91	0.0554	0.00448	572	21.0	9.20E+01	30.0001	0.02181	0.03764	287.677	0.00E+00	7	267.366
299.999	1019.57	0.29423	0.00503	602	21.0	6.64E+02	30.0001	0.00307	0.26074	45.21	0.00E+00	5	299.999
336.593	451.736	0.74511	0.00564	632	21.0	1.84E+03	30.0001	0.00274	0.74675	18.2796	0.00E+00	40	336.593
377.66	102.359	2.07007	0.00633	662	21.0	4.65E+03	30.0001	0.0070	1.88457	8.11608	0.00E+00	33	377.66

TABLE 2

RO 1 Test 1

Stress	Ela	Rate	Torque	Time	Temp	Strain(t)	SS Time	SS Slope	Theta	G'	G"	Position	stress(t)
Pa	Pa-s	s-1	N-m	s	°C	%	s		rad	Pa	Pa		Pa
29.0989	1.70E+05	1.60E-04	5.03E-04	0	21.8	2.28E-01	30.0001	0.32238	0.22E-05	13184.1	0.00E+00	1.06E-38	29.0989
33.6694	DIV0	0	5.64E-04	29	21.8	0.00E+00	30.0001	0	0		0.00E+00	1.06E-38	33.0694
37.7664	DIV0	0	6.33E-04	59	21.8	0.00E+00	30.0001	0	0		0.00E+00	1.06E-38	37.7664
42.3746	DIV0	0	7.10E-04	90	21.8	0.00E+00	30.0001	0	0		0.00E+00	1.06E-38	42.3746
47.5461	1.55E+06	3.07E-05	7.97E-04	120	21.8	7.24E-02	30.0001	0.03246	2.93E-05	65071.1	0.00E+00	1.06E-38	47.5461
53.3485	1.73E+06	3.00E-05	8.94E-04	150	21.8	7.24E-02	30.0001	0.03209	2.93E-05	73604.2	0.00E+00	1.06E-38	53.3485
59.8557	1.70E+06	3.63E-05	0.001	180	21.8	7.24E-02	30.0001	0.03765	2.93E-05	82675	0.00E+00	1.06E-38	59.8557
67.1502	1.66E+06	4.06E-05	0.00113	210	21.8	8.27E-02	30.0001	0.03982	3.35E-05	81167.5	0.00E+00	1.06E-38	67.1502
75.3539	1.10E+06	6.36E-05	0.00126	241	21.8	8.27E-02	30.0001	0.06758	3.35E-05	91071.4	0.00E+00	1.06E-38	75.3539
84.5485	1.23E+06	6.85E-05	0.00142	271	21.8	9.31E-02	30.0001	0.06758	3.77E-05	90830.1	0.00E+00	1.06E-38	84.5485
94.865	2.80E+06	3.27E-05	0.00159	301	21.8	1.24E-01	30.0001	0.08709	5.03E-05	76434.8	0.00E+00	1.06E-38	94.865
106.44	1.82E+06	5.84E-05	0.00178	330	21.8	1.24E-01	30.0001	0.1208	5.03E-05	85761.2	0.00E+00	1.06E-38	106.44
119.428	2.77E+06	4.30E-05	0.002	360	21.8	1.97E-01	30.0001	0.01397	7.96E-05	60774.1	0.00E+00	1.06E-38	119.428
134	2.67E+06	5.02E-05	0.00225	391	21.8	2.40E-01	30.0001	0.00372	1.01E-04	53983.5	0.00E+00	1.06E-38	134
150.351	2.54E+06	5.91E-05	0.00252	421	21.8	2.59E-01	30.0001	0.01432	1.05E-04	58147.7	0.00E+00	1.06E-38	150.351
168.696	2.52E+06	6.70E-05	0.00283	451	21.8	3.62E-01	30.0001	0.00961	1.47E-04	46602	0.00E+00	0	168.696
189.28	2.49E+06	7.60E-05	0.00317	481	21.8	4.34E-01	30.0001	0.01458	1.76E-04	43573.6	0.00E+00	0	189.28
212.376	1.09E+06	1.12E-04	0.00356	511	21.8	5.90E-01	30.0001	0.01287	2.39E-04	36024.6	0.00E+00	0	212.376
238.29	1.29E+06	1.84E-04	0.00399	542	21.8	9.72E-01	30.0001	0.01109	3.94E-04	24510.1	0.00E+00	0	238.29
267.366	4.43E+05	6.03E-04	0.00448	572	21.8	2.93E+00	30.0001	6.38E-07	0.00119	9134.52	0.00E+00	0	267.366
299.989	9453.04	0.03173	0.00503	602	21.8	5.38E+01	30.0001	0.03555	0.02181	557.144	0.00E+00	0	299.989
336.505	207.715	1.62042	0.00564	632	21.8	2.14E+03	30.0001	0.02396	0.08562	15.7479	0.00E+00	0	336.505

TABLE 3

Tomato . Triple Concentrate

Stress	Eta	Rate	Torque	Time	Temp	Strain(t)	SS Time	SS Slope	Theta	Position	N1	NormalForce
Pa	Pa-s	s-1	N-m	s	°C	%	s		rad		Pa	N
4.99982	DIV0	0.00E+00	8.38E-05	0	20	0.00E+00	30.0001	0	0	1	0	0
5.60089	DIV0	0.00E+00	9.40E-05	20	20	0.00E+00	30.0001	0	0	1	0	0
6.2944	DIV0	0.00E+00	1.05E-04	60	20	0.00E+00	30.0001	0	0	1	0	0
7.06244	DIV0	0.00E+00	1.18E-04	90	20	0.00E+00	30.0001	0	0	1	0	0
7.92418	DIV0	0.00E+00	1.33E-04	121	20	0.00E+00	30.0001	0	0	1	0	0
8.89108	DIV0	0.00E+00	1.49E-04	151	20	0.00E+00	30.0001	0	0	1	0	0
9.97595	DIV0	0.00E+00	1.67E-04	180	20	0.00E+00	30.0001	0	0	1	0	0
11.1932	DIV0	0.00E+00	1.88E-04	211	20	0.00E+00	30.0001	0	0	1	0	0
12.559	DIV0	0.00E+00	2.10E-04	241	20	0.00E+00	30.0001	0	0	1	0	0
14.0914	DIV0	0.00E+00	2.36E-04	272	20	0.00E+00	30.0001	0	0	1	0	0
15.8108	DIV0	0.00E+00	2.65E-04	302	20	0.00E+00	30.0001	0	0	1	0	0
17.74	DIV0	0.00E+00	2.97E-04	331	20	0.00E+00	30.0001	0	0	1	0	0
19.9046	DIV0	0.00E+00	3.34E-04	362	20	0.00E+00	30.0001	0	0	1	0	0
22.3334	DIV0	0.00E+00	3.74E-04	392	20	0.00E+00	30.0001	0	0	1	0	0
25.0585	DIV0	0.00E+00	4.20E-04	423	20	0.00E+00	30.0001	0	0	1	0	0
28.1161	DIV0	0.00E+00	4.71E-04	452	20	0.00E+00	30.0001	0	0	1	0	0
31.5467	DIV0	0.00E+00	5.29E-04	482	20	0.00E+00	30.0001	0	0	1	0	0
35.396	DIV0	0.00E+00	5.93E-04	513	20	0.00E+00	30.0001	0	0	1	0	0
39.715	9.61E+05	4.13E-05	6.65E-04	543	20	7.24E-02	30.0001	0.04696	2.03E-05	1	0	0
44.561	8.63E+05	5.16E-05	7.47E-04	574	10.99	7.24E-02	30.0001	0.05922	2.93E-06	1	0	0
49.9902	7.72E+05	6.46E-05	8.38E-04	603	20	0.27E-02	30.0001	0.06921	3.35E-05	1	0	0
56.0989	1.53E+06	3.66E-05	9.40E-04	633	20	1.14E-01	30.0001	0.09517	4.61E-05	1	0	0
62.944	1.40E+06	4.25E-05	0.00105	664	20	1.24E-01	30.0001	0.10568	5.03E-05	1	0	0
70.6244	1.67E+06	4.22E-05	0.00118	694	20	1.66E-01	30.0001	0.01448	6.28E-05	1	0	0
79.2418	1.88E+06	4.21E-05	0.00133	725	20	2.07E-01	30.0001	0.01343	8.38E-05	1	0	0
88.9108	1.66E+06	5.30E-05	0.00149	754	20	2.38E-01	30.0001	0.0129	9.63E-05	1	0	0
99.7595	1.90E+06	5.25E-05	0.00167	784	20	2.90E-01	30.0001	0.01318	1.17E-04	1	0	0
111.932	1.81E+06	6.06E-05	0.00188	815	20	3.52E-01	30.0001	0.0119	1.42E-04	1	0	0
125.59	1.65E+06	7.60E-05	0.0021	845	20	4.65E-01	30.0001	0.01450	1.89E-04	1	0	0
140.914	1.54E+06	9.15E-05	0.00236	876	20	5.27E-01	30.0001	0.00889	2.14E-04	1	0	0

Cont. TABLE 3

168.108	1.48E+00	1.00E-04	0.00265	005	20	8.41E-01	30.0001	0.00004	2.80E-04	1	0	0
177.4	1.27E+06	1.40E-04	0.00207	035	20	8.60E-01	30.0001	0.00674	3.62E-04	1	0	0
190.048	7.47E+05	2.87E-04	0.00334	068	20	1.20E+00	30.0001	0.01828	5.24E-04	1	0	0
223.334	60884.3	3.80E-03	0.00374	996	20	0.01E+00	30.0001	0.03482	0.00324	1	0	0
250.586	8802.51	3.68E-02	0.0042	1028	20	0.24E+01	30.0001	0.01180	0.03744	1	0	0
281.181	2821.89	1.07E-01	0.00471	1057	20	2.93E+02	30.0001	0.00241	0.11884	0	0	0
315.407	1278.83	2.47E-01	0.00520	1087	20	6.60E+02	30.0001	0.00264	0.26955	40	0	0
353.86	610.007	5.71E-01	0.00593	1116	20	1.40E+03	30.0001	0.0048	0.59812	43	0	0
397.140	337.724	1.18E+00	0.00665	1148	20	3.06E+03	30.0001	0.00624	1.24068	33	0	0
446.005	167.328	2.68E+00	0.00747	1177	20	0.24E+03	30.0001	0.0074	2.52762	12	0	0
400.384	1.01203	4.92E+02	0.00835	1207	20	5.00E+05	30.0001	0.01688	205.036	40	0	0

TABLE 4

DC test 1

Stress Pa	Eta Pa-s	Rate s-1	Torque N-m	time s	Temp °C	Strain(t) %	SS Time s	SS Slope	theta rad	G' Pa	G'' Pa	Position	stress(t) Pa
40,0982	7,53E+05	6,64E-05	8,30E-04	0	21,8	8,40E-01	30,0001	0,0197	3,43E-04	5895,32	0,00E+00	2	40,0982
56,0909	1,09E+06	5,14E-05	9,40E-04	20	21,8	1,06E-01	30,0001	0,00955	7,54E-05	30133,4	0,00E+00	2	56,0909
62,944	1,18E+06	5,34E-05	0,00105	50	21,8	2,07E-01	30,0001	0,00917	8,30E-05	30429,2	0,00E+00	2	62,944
70,6244	8,48E+05	8,33E-05	0,00118	90	21,8	2,30E-01	30,0001	0,06719	9,83E-05	29808,8	0,00E+00	2	70,6244
79,2418	1,33E+06	5,94E-05	0,00133	120	21,8	2,30E-01	30,0001	0,0172	9,83E-05	33311,4	0,00E+00	2	79,2418
88,9108	1,32E+06	6,75E-05	0,00149	150	21,8	3,00E-01	30,0001	0,00631	1,21E-04	29643,1	0,00E+00	2	88,9108
99,7598	1,18E+06	8,48E-05	0,00167	180	21,8	4,03E-01	30,0001	0,00977	1,83E-04	24731,8	0,00E+00	2	99,7598
111,932	9,08E+05	1,24E-04	0,00188	210	21,8	5,07E-01	30,0001	0,01481	2,05E-04	22088,4	0,00E+00	2	111,932
125,59	9,29E+05	1,35E-04	0,0021	241	21,8	7,24E-01	30,0001	0,0061	2,93E-04	17346,9	0,00E+00	2	125,59
140,914	6,45E+05	2,69E-04	0,00236	271	21,8	1,15E+00	30,0001	0,0408	4,65E-04	12274,3	0,00E+00	2	140,914
158,108	2,80E+05	5,65E-04	0,00265	301	21,8	2,40E+00	30,0001	0,06567	9,72E-04	6509,2	0,00E+00	2	158,108
177,4	58308,2	0,00304	0,00297	331	21,8	8,09E+00	30,0001	0,02047	0,0036	1994,15	0,00E+00	2	177,4
199,046	5094,7	-0,03907	0,00334	360	21,8	7,95E+01	30,0001	0,01121	0,03222	250,229	0,00E+00	1	199,046
223,334	1455,9	0,1534	0,00374	391	21,8	3,72E+02	30,0001	0,00394	0,15084	59,965	0,00E+00	0	223,334
250,585	711,847	0,35202	0,0042	421	21,8	9,31E+02	30,0001	0,00168	0,37721	26,9047	0,00E+00	47	250,585
281,16	370,474	0,74288	0,00471	451	21,8	1,89E+03	30,0001	0,00522	0,76659	14,8541	0,00E+00	41	281,16
315,463	166,641	1,80307	0,00529	481	21,8	4,52E+03	30,0001	0,01059	1,8305	6,97965	0,00E+00	26	315,463
338,064	0,07151	305,61	0,00563	511	21,8	9,24E+04	30,0001	0,22919	37,4415	0,36352	0,00E+00	38	338,064

TABLE 5

C cent: 1

Stress Pa	Eta Pa-s	Rate s-1	Torque N-m	time s	Temp °C	Strain(t) %	SS Time s	SS Slope	theta rad	G' Pa	G" Pa	Position	stress(t) Pa
9,99964	1,70E+05	5,58E-05	1,80E-04	0	21,0	6,62E-01	30,0001	0,02358	2,68E-04	1510,67	0,00E+00	20	9,99964
11,2198	3,38E+05	3,32E-05	1,88E-04	30	21,0	1,14E-01	30,0001	0,07678	4,61E-05	8861,85	0,00E+00	28	11,2198
12,5888	1,29E+05	9,76E-05	2,11E-04	60	21,0	1,55E-01	30,0001	0,0804	6,28E-05	8114,48	0,00E+00	20	12,5888
14,1249	3,64E+05	3,99E-05	2,37E-04	91	21,0	1,24E-01	30,0001	0,11779	5,03E-05	11380,7	0,00E+00	20	14,1249
15,8484	4,36E+05	3,63E-05	2,66E-04	121	21,0	1,55E-01	30,0001	0,01298	6,28E-05	10215,5	0,00E+00	20	15,8484
17,7822	2,98E+05	6,02E-05	2,98E-04	151	21,0	1,76E-01	30,0001	0,0277	7,12E-05	10113,5	0,00E+00	20	17,7822
19,9519	3,52E+05	5,67E-05	3,34E-04	181	21,0	2,07E-01	30,0001	0,02512	8,38E-05	9646,41	0,00E+00	20	19,9519
22,3864	3,66E+05	6,12E-05	3,76E-04	211	21,0	3,21E-01	30,0001	0,00972	1,30E-04	8082,15	0,00E+00	20	22,3864
25,118	2,41E+05	1,04E-04	4,21E-04	241	21,0	5,07E-01	30,0001	0,00409	2,05E-04	4956,27	0,00E+00	20	25,118
28,1828	59865	4,71E-04	4,72E-04	271	21,0	2,20E+00	30,0001	0,11241	8,92E-04	1278,3	0,00E+00	20	28,1828
31,6217	28718,5	0,00110	5,30E-04	301	21,0	4,70E+00	30,0001	0,03648	0,00194	661,773	0,00E+00	20	31,6217
35,4802	1395,92	0,02542	5,94E-04	331	21,0	5,19E+01	30,0001	0,01768	0,02104	68,3086	0,00E+00	20	35,4802
39,8091	333,057	0,11953	6,67E-04	361	21,0	2,98E+02	30,0001	0,00875	0,12082	13,366	0,00E+00	27	39,8091
44,6684	136,674	0,32681	7,48E-04	392	21,0	8,57E+02	30,0001	0,00409	0,34692	5,21437	0,00E+00	24	44,6684
50,1159	68,4756	0,73188	8,40E-04	422	21,0	1,91E+03	30,0001	0,00037	0,77453	2,62055	0,00E+00	10	50,1159
56,2312	36,277	1,55006	9,42E-04	452	21,0	3,94E+03	30,0001	0,00335	1,59654	1,42733	0,00E+00	5	56,2312
63,0904	19,0316	3,16534	0,00106	482	21,0	7,90E+03	30,0001	0,00403	3,23394	0,79011	0,00E+00	20	63,0904
70,7596	7,04429	0,02051	0,00119	512	21,0	1,99E+04	30,0001	0,01829	8,04345	0,35829	0,00E+00	12	70,7595
79,3276	2,13102	37,2094	0,00133	543	21,0	7,17E+04	30,0001	0,01495	29,0404	0,11083	0,00E+00	21	79,3276
89,2037	1,09677	81,3328	0,00149	573	21,0	2,22E+05	30,0001	0,01263	90,0674	0,04011	0,00E+00	31	89,2037
100,243	0,69726	143,787	0,00168	602	21,0	4,08E+05	30,0001	0,01538	165,166	0,02458	0,00E+00	26	100,243
112,30	0,4634	247,081	0,00188	632	21,0	6,70E+05	30,0001	0,00614	271,461	0,01677	0,00E+00	47	112,30
126,18	0,33550	376,004	0,00211	663	21,0	1,07E+06	30,0001	0,00542	433,814	0,01178	0,00E+00	33	126,18
141,308	0,2491	567,283	0,00237	693	21,0	1,65E+06	30,0001	0,00337	669,478	0,00856	0,00E+00	31	141,308
158,346	0,19264	821,993	0,00265	723	21,0	2,35E+06	30,0001	0,0017	953,198	0,00673	0,00E+00	38	158,346
177,42	0,15473	1077,01	0,00297	754	21,0	3,19E+06	30,0001	0,00260	1293,01	0,00556	0,00E+00	4	177,42
199,079	0,1382	1440,49	0,00334	784	21,0	4,11E+06	30,0001	0,00196	1664,01	0,00486	0,00E+00	3	199,079
223,337	0,11941	1870,29	0,00374	814	21,0	5,28E+06	30,0001	0,00135	2138,97	0,00423	0,00E+00	29	223,337
251,339	0,11326	2219,04	0,00421	845	21,0	6,74E+06	30,0001	3,04E-04	2729,09	0,00373	0,00E+00	34	251,339
282,139	0,10672	2643,73	0,00473	875	21,0	7,78E+06	30,0001	5,49E-04	3152,6	0,00362	0,00E+00	31	282,139
316,074	0,09486	3329,83	0,00529	905	21,0	9,40E+06	30,0001	5,93E-04	3040,24	0,00333	0,00E+00	45	316,074

TABLE 6

Stress Pa	Eta Pa-s	Rate s-1	Torque N-m	Time s	Temp °C	Strain(t) %	SS Time s	SS Slope	Theta rad	Position	N1 Pa	NormalForce N
0,66000	34728,3	5,386E-06	7,05E-06	30	20	0,0055007	30	0,01036	2,78263E-06	31	0	0
0,62044	#DIV/0!	0	7,01E-06	60	20	0	30	0	0	31	0	0
0,70824	27410,7	8,588E-06	8,87E-06	90	20	0,0027053	30	0,0140433	1,39827E-06	31	0	0
0,7024367	21660,36	3,423E-05	0,058E-06	121	20	0,0279037	30	0,00843	1,30627E-05	31	0	0
0,8001067	19508,36	3,970E-06	1,117E-05	151	20	0,0111737	30	0,1018433	5,58507E-06	31	0	0
0,0078	#DIV/0!	0	1,264E-05	181	20	0	30	0	0	31	0	0
1,11833	#DIV/0!	0	1,407E-05	211	20	0	30	0	0	31	0	0
1,2556033	6142,9	8,816E-06	1,678E-05	241	20	0,0139027	30	0,0882033	8,08133E-06	31	0	0
1,409014	28574,8	1,044E-06	1,771E-05	271	20	0,011160	30	0,0103433	0,000006885	31	0	0
1,581108	#DIV/0!	0	1,087E-05	302	20	0	30	0	0	31	0	0
1,774	#DIV/0!	0	2,229E-06	332	20	0	30	0	0	31	0	0
1,9904067	14788	4,487E-05	2,501E-06	362	20	0,04103	30	0,0000367	0,000020044	31	0	0
2,23334	80285,6	1,871E-06	2,807E-05	392	20	0,0303223	30	0,0232667	1,81517E-06	31	0	0
2,50585	87918,3	2,856E-05	3,149E-05	423	20	0,050043	30	0,0361333	0,000020022	31	0	0
2,81181	96962,2	4,266E-05	3,933E-05	453	20	0,067021	30	0,0512333	0,00003351	31	0	0
3,15487	87012,787	3,776E-06	3,984E-05	483	20	0,083778	30	0,06328	0,000041888	31	0	0
3,5308	124813,33	2,861E-05	4,448E-05	513	20	0,1117133	30	0,08138	5,58603E-05	31	0	0
3,9716	88556,1	8,714E-06	4,991E-05	543	20	0,1308333	30	0,09377	0,000068417	31	0	0
4,4680067	101738,83	4,020E-05	5,6E-05	573	20	0,1703667	30	0,12501	8,51717E-05	31	0	0
4,99082	98181,133	5,130E-05	0,283E-05	604	20	0,2178267	30	0,0008167	0,00010801	31	0	0
5,60080	81155,067	8,056E-05	7,05E-06	634	20	0,28205	30	0,0140378	0,000141023	31	0	0
6,2044	81487,067	0,0001024	7,91E-05	664	20	0,4210833	30	0,0127067	0,000210037	31	0	0
7,00244	67414,233	0,0001246	8,876E-05	694	20	0,7511367	30	0,0335033	0,000376607	31	0	0
7,92418	54778,867	0,0002348	0,05E-05	725	20	1,0000967	30	0,0291167	0,000504053	31	0	0
8,9910033	21250,2	0,0004212	0,0001117	755	20	1,7000333	30	0,0453267	0,000805003	31	0	0
9,9740233	12228,87	0,000800	0,0001254	786	20	3,0033667	30	0,2000367	0,001033333	31	0	0
11,183233	6367,07	0,0021313	0,0001407	816	20	0,6060333	30	0,1100067	0,0048	31	0	0
12,558867	500,45267	0,0288107	0,0001578	845	20	01,335333	30	0,0287367	0,030073333	31	0	0
14,001233	111,60037	0,1260233	0,0001771	875	20	316,60333	30	0,0063167	0,167883333	30	0	0
15,610567	60,501267	0,2804033	0,0001987	906	20	707,70	30	0,0000267	0,3830	43	0	0
17,7307	35,640233	0,6004367	0,0002229	930	20	1404,8	90	0,0043067	0,702426667	37	0	0
19,004	24,290033	0,82184	0,0002501	966	20	2317,7993	30	0,00374	1,1688833333	28	0	0
22,3332	17,133133	1,3038333	0,0002806	996	20	3609,0333	30	0,0040233	1,84951	13	0	0
26,067667	12,1413	2,0005	0,0003148	1027	20	6830,7333	30	0,0032967	2,9183000667	39	0	0
28,116	8,8815333	3,1700	0,0003533	1057	20	9000,0	30	0,0028333	4,60031	19	0	0
31,6400	6,6317467	4,0012333	0,0003964	1087	20	13010	30	0,00403	6,96467	28	0	0
36,303	4,7740233	7,4010667	0,0004448	1118	20	21032	30	0,0020567	10,06000667	24	0	0
80,7122	3,2612267	12,187667	0,000400	1148	20	34330,333	30	0,00643	17,100	33	0	0
44,630667	1,0027033	23,437333	0,0005600	1177	20	60407	30	0,01064	30,24628667	18	0	0

Table 7

Test of the saucing power and organoleptic properties on the invention products Ro1 and Ro2 and on commercial tomato products: triple concentrate, double concentrate, concentrate and tomato passatas.

Product	Condiment attached to the pasta (g)	Saucing power	Organoleptic properties (taste, smell)
Ro2 (Ex. 1)	88.0	8.8	delicate taste of fresh tomato, fresh tomato smell
Ro1 (Ex. 2)	97.8	9.8	very good taste and fresh tomato smell
triple concentrate (TC)	70.0	7	caramel, bitter taste, the tomato is not recognized; cooking ("cotto") smell
double concentrate (DC)	65.0	6.5	caramel taste, the tomato is not recognized; cooking ("cotto") smell.
concentrate (C)	62.0	6.2	very sweet taste, the tomato is not recognized; tomato smell
tomato passatas	40.0	4	boiled pasta taste, very light tomato smell